

Human Abortion Associated with Infection by Ovine Abortion Agent

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Stamp *et al.* (1950) showed that abortion in sheep was caused by a virus-like agent, enzootic abortion of ewes or ovine abortion virus. In affected flocks, abortion, premature lambing, and the birth of decomposed lambs are striking clinical signs of the disease. These generally take place late in pregnancy, but a number of dead or weakly lambs may be born at the proper lambing time. The ewe is generally little affected in health, and the main clinical manifestations of the disease do not give a true incidence of infection. Healthy lambs may be born from apparently healthy ewes, yet the foetal membranes may show lesions and be infected. When these lambs, and surviving weakly lambs, mature and become pregnant they may abort. The infection remains latent until they develop placental tissue in which the virus multiplies selectively. This disease is endemic in sheep in South-east Scotland, and from here it has often spread to other parts. Several outbreaks occur in Ayrshire each year. The agent belongs to the Bedsonia group of organisms, common parasites of warm-blooded animals, some causing human infections such as ornithosis, trachoma, inclusion conjunctivitis, and lymphogranuloma venereum. The possible susceptibility of man to infection with other members of this group is obviously of interest. The following case is of human abortion attributable to the enzootic abortion of ewes virus.

CASE REPORT

A woman aged 22 was admitted to Ayrshire Central Hospital on 4 December 1965 complaining of headache, pain in the back, shivering and sweating, heartburn, and frequent vomiting. These symptoms had begun four days before admission. She had also been febrile during this time and had been given injections of penicillin and streptomycin without effect. She was just over six months pregnant.

On examination she was acutely ill, temperature 102.4° F. (39.1° C.). She was mentally rather confused and had some meningismus. No other abnormal clinical signs were present except for those expected in a febrile dehydrated patient. No obstetrical abnormality was found. Examination of peripheral blood showed anaemia and leucopenia, the haemoglobin being 8.8 g./100 ml., P.C.V. 27%, M.C.H.C. 32%, and W.B.C. 2,100/cu. mm., with white cells in normal proportions. Her blood urea level was 42 mg./100 ml.; serum sodium, potassium, and chloride levels were all low. Four blood cultures were sterile. Chest x-ray examination was negative. Bacteriological examination of sputum, urine, and faeces revealed no pathogens. Lumbar puncture showed clear fluid-cell count 1/cu. mm., protein 12 mg./100 ml. Liver-function tests were within normal limits, except for a slight increase in thymol turbidity. Widal, Paul-Bunnell, and *Brucella abortus* agglutination tests were negative. She had a swinging temperature for four days, during which time she was treated symptomatically, and then was given tetracycline 500 mg. six-hourly for eight days. Her symptoms soon abated; the temperature settled in 48 hours and thereafter remained normal, and she made a good recovery. Four days after tetracycline was stopped she aborted precipitately and with very little warning. The placenta appeared unhealthy, being covered with a dirty greyish exudate. Histological examination showed infarcted placental tissue. There was little upset from this event, and she was dismissed home a few days later.

Antibody Titres of Patient's Serum

Test	Date of Serum		
	6/12/65	17/12/65	12/1/66
Complement fixation:			
Bedsonia group	16	512	512
Microagglutination:			
E.A.E. (Q18 strain)	<20 (±)	20	640
Psittacosis	<20	<20	<20
Rickettsiae*	<20	<20	<20

* *R. prowazeki*, *R. mooseri*, *R. burnetii*; trace reaction with *R. conorii*.

Viological Investigations.—Serological tests gave no evidence of infection with influenza A, B, or C, adenovirus, or Q fever. As shown in the Table, diagnostic rising antibody titres were found by complement-fixation tests with Bedsonia-group antigen and by micro-agglutination tests with enzootic abortion of ewes virus but not with psittacosis or rickettsial antigens. Attempts to show enzootic abortion of ewes virus in placenta by microscopical examination of stained smears or attempted isolation in mice were unsuccessful, as only a small specimen was available, and this had decomposed through delay in transit to the laboratory.

Epidemiological Investigations.—There was no history of recent illness of the husband or other human contacts. No history of direct contact with animals or birds was obtained except for occasional visits to a house with a budgerigar and from a friend with a dog. The patient's home bordered on agricultural land on which sheep were kept.

COMMENT

Human infection with enzootic abortion of ewes virus has rarely been recognized. Because of its relatively low pathogenicity for man, enzootic abortion of ewes virus is often used in preference to the dangerous psittacosis agent for laboratory purposes—for example, preparation of group-specific complement-fixing antigen for routine diagnostic tests. Barwell (1955) described an accidental laboratory infection with enzootic abortion of ewes virus which took the form of extensive nonfatal pneumonia.

In the present case the rising titres of complement-fixing antibody leave no doubt that the illness was associated with infection with an agent of the Bedsonia group, and the micro-agglutination tests incriminate enzootic abortion of ewes virus as the member of the group concerned. Human infections with organisms of the Bedsonia group are not uncommon, though the frequent failure to identify avian sources of infection (Grist and McLean, 1964) suggests that some may be acquired from animals—for example, sheep which were in the vicinity of our patient's home.

Experimental infections with enzootic abortion of ewes virus can cause abortions in pregnant cattle, rabbits, and rats (Giroud and Dumas, 1959; Payne and Belyavin, 1960). The relative resistance of non-pregnant animals and the localization of lesions and infections in placenta suggest that the presence of placental tissue facilitates establishment of the infection. Selective multiplication in placental tissue has also been shown with other organisms of the Bedsonia group (Parker and Younger, 1963; Pierce *et al.*, 1963).

Lefebvre (1962) and Giroud (1966) have reported an association between human abortion and infection with various organisms of the rickettsia and Bedsonia groups. Our case provides evidence of this in Britain, and it seems possible that investigations of pregnant women with fever or abortion might show that this condition is more common than is generally recognized.

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